Space Weather Forecast

Issued on Saturday, 01 October 2022 at 01:13 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: G1-G2/Minor-Moderate geomagnetic storms expected days 1 and 2. Chance of G3/Strong storm from CME arrival day 1. Moderate solar activity considered Likely.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Moderate over the past 24 hours with a Moderate class flare observed at 30/1622 UTC, which appears to have originated from the new region rotating around the northeast limb. This has been the source of several coronal mass ejections (CME's) over recent days and is expected to be the most active region on the disc in the coming days. There are currently six numbered sunspots on the visible disc, which all appear to be relatively stable, away from the region in the northeast.

Solar Wind / Geomagnetic Activity: Solar wind parameters were indicative of continued fast wind influence, with an embedded transient. Solar wind speeds, as measured by DSCOVR at L1, have been mostly at elevated levels, with a peak of 600 km/s around 30/0600 UTC. The magnetic field strength started weak, then became moderate after 30/0430 UTC. The all important north-south component was weak initially, then increased after 30/0430 UTC with periods in the negative orientation. Geomagnetic activity was Unsettled to Active (Kp 3-4) initially, becoming Quiet (Kp 1-2) by the end of the period.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at or near normal background levels, and well below the level of a solar radiation storm.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is forecast to be Low, probably increasing to Moderate, with isolated Moderate-class flares considered likely.

Solar Wind / Geomagnetic Activity: The coronal mass ejection from the filament eruption on 28/0400 UTC has the potential to move across Earth today (1st). Solar winds are expected to be steady at first today, around elevated levels, before the next fast wind enhancements arrive today, then persisting through days 2 and 3 (2nd and 3rd). Quiet geomagnetic activity at first, with possible isolated Unsettled intervals. Geomagnetic activity is expected to increase today to Minor to Moderate storm levels. Activity levels may increase further from any coronal mass ejection (CME) arrival, with a chance of isolated Strong Storms intervals. Activity easing to Quiet to Unsettled by day 4 (4th).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is likely to persist close to background levels with no solar radiation storms occurring.

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Met Office Space Weather Forecast

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	80	70	30	10
Strong	G3	No	30	10	1	1
Severe	G4	No	5	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	40	60	60	60
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	2	2	2	2
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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